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THE BRITISH RUBI.

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THE

BRITISH RUBI:

AN ATTEMPT TO

DISCRIMINATE THE SPECIES OF RUBUS KNOWN
TO INHABIT THE BRITISH ISLES.

BY

CHARLES CARDALE BABINGTON, M.A. F.R.S.
PROFESSOR OF BOTANY IN THE UNIVERSITY OF CAMBRIDGE.

BIBLIOTHECA · BODLEIANA

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NOTICE.

It was intended that a series of Quarto Plates should accompany this Essay. But as after much unavoidable delay it is still impossible for them to be very soon ready for publication, the Author has thought it unadvisable to defer the issue of the description and remarks upon the species. He hopes on a future occasion to publish the plates as a distinct work.

The Author desires to express his grateful acknowledgments to the Syndics of the University Press for their liberality in granting him the expense of the Printing and Paper of this Volume.

Species Ruborum [Britannicas] diligenter examinare et descriptionibus, quoad fieri potuerit, perfectis illustrare conati sumus, memores verborum Linnæi "ne varietas loco speciei sumatur, ubique cavendum est." ARRH. *Monog.* 58.

PREFACE.

Having acquired, chiefly through the kindness of different botanists, but partly by purchase, what is probably by far the most extensive collection of Brambles which has ever been formed in this country, I have thought it well to draw up such an account of them as these opportunities, and a tolerably long-continued study of *Rubi*, has enabled me to prepare. My collection contains nearly all Leighton's *Rubi*, including the specimens submitted by him to the examination of Nees von Esenbech, Borrer, and Lindley, and named and commented upon by them; a very complete set of Bloxam's specimens, and also of those of Bell Salter and Lees. I have many specimens named by Borrer, Coleman, Hort, and other students of this difficult genus; have myself collected Brambles extensively in various parts of the kingdom, and have had many species long in cultivation in the Cambridge Botanic Garden. This account of the collection will shew that the opportunities within my reach are such as to render it probable that at least some valuable results may be attained by its study. Unfortunately there is great difficulty in obtaining authentic specimens of such unwieldy plants from continental botanists, nevertheless my Herbarium does contain a considerable number of them. Reichenbach's *Flora exsiccata* supplies a few, Fries's invaluable *Herbarium normale* others, Wirtgen's *Herbarium Ruborum Rhenanorum* a considerable number; the Abbe Questier has given to me a very extensive series of the French species, and I possess others obtained from Dr F. Schultz and Professor C. Billot. Unfortunately no botanist in Britain is known to have typical specimens of the plants figured in the *Rubi Germanici*, of those described by Godron in the *Flore de France*, or by Boreau in his *Flore du centre de la France.* A few also of those included in Arrhenius's valuable *Monographia Ruborum Sueciæ* are unknown to me, although several which I did not before possess have been kindly sent by Mr Joh. Lange of Copenhagen.

It is believed that the following essay will afford the means of determining many, perhaps most, of our species: but it is only by careful and long-continued study that any person can expect to attain a correct knowledge of such difficult plants. My hope is that the readers of this book will endeavour to correct the mistakes into which I am sure to have fallen; for with the utmost care, and I may venture to add that no care has been neglected, I cannot avoid feeling convinced that the truth has only been approached, and that perhaps rather distantly in some cases.

Several botanists of the highest eminence both in this country and upon the European continent have thought that all our brambles are infinitely varying hybrids or forms of one, two, or as some think four species. Such an opinion is the natural result of an examination of a few specimens, perhaps not very perfect, preserved in an Herbarium. But if much study of the plants in their native places of growth is combined with that of an extensive series of preserved specimens of each form, it does seem to me that nature possesses many more species than those distinguished men are prepared to admit. It is quite likely that the time may come when several of the forms here looked upon as species will be shewn not to be distinct from others. The many blunders which have been made by myself and other students of this difficult genus would make it very presumptuous in me to think otherwise. Dr Godron in his valuable essay *Le genre Rubus considéré au point de vue de l'espèce*, (*Mém. de la Société R. de Nancy*, 1849, p. 210), has shewn conclusively that we cannot reduce all the European *Rubi* to the species described by Linnæus, and proved that there are real and constant characters by which to distinguish as true species many more than were known to the great Swedish botanist.

As a contrast to the idea that the number of species is small, it may be mentioned that a German botanist, (P. J. Müller) has published (16 and 17 *Jahresberichte der Pollichia*) descriptions of what are supposed by him to be 236 species of *Rubi* inhabiting France and Germany. I believe these to be descriptions of mere forms. They might have been of considerable value had their author more frequently identified his plants with those of other botanists, or pointed out their distinctions from them: also, if he had given specific characters or even a synoptical table of his plants. Without either of these helps it is exceedingly difficult to identify them. Fortunately specimens of a considerable number of them are published in Wirtgen's excellent *Herb. Ruborum Rhenanorum*, and many others are contained in Mr J. G. Baker's extensive Herbarium, which he most kindly placed for a lengthened period in my hands.

CAMBRIDGE,
May 1, 1869.

GEOGRAPHICAL DISTRIBUTION OF THE SPECIES.

PROVINCES.	Peninsula.	Channel.	Thames.	Ouse.	Severn.	S. Wales.	N. Wales.	Trent.	Mersey.	Humber.	Tyne.	Lakes.	W. Lowlands.	E. Lowlands.	E. Highlands.	W. Highlands.	N. Highlands.	N. Isles.	S. Atlantic.	Blackwater.	Barrow	Leinster Coast.	Liffey and Boyne.	Lower Shannon.	Upper Shannon.	N. Atlantic.	N. Connaught.	Erne.	Donegal.	Ulster Coast.
RUBUS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. Idæus	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	...	18	19	20	21	22	23	24	25	26	27	28	29	30
2. Leesii	1	...	...	...	...	...	...	...	...	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3. suberectus	1	2	3	...	5	...	7	8	...	10	...	12	13	14	15	16	...	...	19	...	...	...	...	...	...	26	...	...	...	30
4. fissus	1	...	...	...	5	...	7	8	9	10	11	12	13	...	15	16	...	...	...	...	...	...	...	...	...	...	...	...	...	30
5. plicatus	1	2	3	...	5	6	...	8	9	10	11	12	13	14	15	16	...	...	19	...	...	...	23	...	25	...	...	...	...	30
6. affinis	1	2	3	...	5	6	7	8	9	10	...	12	13	14	15	16	...	...	19	...	...	...	...	...	...	...	...	...	...	...
7. Lindleianus......	1	2	3	4	5	6	7	8	9	10	11	12	13	...	15	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8. rhamnifolius	1	2	3	4	5	...	7	8	...	10	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9. incurvatus	...	2	3	...	...	6	7	...	...	...	...	12	...	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10. imbricatus	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11. latifolius	...	...	...	...	5	...	...	...	...	...	...	...	...	14	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12. discolor	1	2	3	4	5	6	7	8	9	10	11	12	13	...	...	16	...	...	19	...	21	...	23	24	...	...	...	28	...	30
13. thyrsoideus	...	2	3	4	5	...	7	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
14. leucostachys	1	2	3	...	5	6	7	8	9	10	11	12	...	14	...	...	...	...	19	...	...	...	...	24	...	26	...	...	...	30
15. Grabowskii	...	2	...	...	...	...	7	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16. Colemanni	...	...	...	...	5	...	...	8	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17. Salteri	1	2	...	...	5	...	7	8	...	10	...	...	...	...	...	...	...	...	19	...	...	...	...	...	...	...	...	...	...	30
18. carpinifolius.....	...	2	3	4	5	6	7	8	9	10	11	12	...	...	...	16	...	...	19	...	...	...	...	...	...	...	...	...	...	...

19. villicaulis	1	2	3	...	5	...	7	8	...	10	11	12	...	14	15	...	17	...	19	20	...	...	23	...	...	26	...	...	...	30
20. macrophyllus	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	...	...	19	...	...	...	23	...	...	...	...	...	...	30
21. mucronulatus	1	...	...	...	5	...	7	8	...	...	...	...	...	14	15	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22. Sprengelii	...	2	3	...	5	...	7	8	9	10	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23. Bloxamii	1	...	...	...	5	...	...	8	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
24. Hystrix	1	2	3	4	5	...	...	8	...	10	11	...	...	...	...	...	...	...	19	...	...	...	...	...	...	...	...	...	...	...
25. rosaceus	1	2	3	...	5	...	7	8	...	10	11	12	...	...	...	...	...	...	19	...	...	...	...	...	25	...	...	...	...	...
26. pygmæus	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27. scaber	1	2	3	...	5	...	7	8	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28. rudis	1	2	3	...	5	6	7	8	...	10	11	12	13	14	...	...	...	...	...	...	...	22	23	...	...	...	...	...	...	...
29. Radula	1	2	3	4	5	6	...	8	...	10	11	...	13	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
30. Koehleri	1	2	3	4	5	...	7	8	9	10	11	12	13	...	15	16	...	...	19	...	...	...	...	...	...	...	...	...	...	30
31. fusco-ater	...	2	...	...	5	...	...	8	...	10	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32. diversifolius	1	2	3	4	5	6	7	...	9	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33. Lejeunii	...	2	3	...	5	...	7	...	9	10	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34. pyramidalis	1	...	...	...	5	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35. Güntheri	1	...	3	...	5	...	...	8	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36. humifusus	...	...	3	...	5	...	7	...	9	10	11	12	13	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30
37. foliosus	1	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38. glandulosus	...	2	3	...	5	...	7	8	...	10	...	...	...	...	...	...	...	...	19	...	...	...	...	...	...	...	...	...	...	...
39. Balfourianus	1	...	3	4	5	...	...	...	9	10	...	12	...	14	...	...	...	...	...	...	21	...	...	...	...	...	...	...	...	...
40. corylifolius	1	2	3	4	5	6	7	8	9	10	...	...	13	...	15	16	...	...	...	20	...	...	...	...	...	26	...	...	...	30
41. althæifolius	1	2	3	4	5	...	...	...	9	10	11	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42. tuberculatus	...	2	3	4	5	...	...	8	...	10	...	12	...	...	...	...	...	...	...	...	21	...	23	...	...	...	...	...	...	...
43. cæsius	1	2	3	4	5	6	7	8	...	10	11	...	13	14	...	...	...	...	19	20	...	...	...	24	...	26	27	28	...	30
44. saxatilis	...	...	...	...	5	...	7	...	9	10	11	12	...	14	15	16	...	18	19	...	...	...	...	24	...	...	...	...	29	30
45. Chamæmorus	...	...	...	...	...	...	7	8	...	10	11	...	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	28	...	...

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HISTORICAL SKETCH.

A SHORT account of the progress made in the study of the fruticose Brambles by English botanists will probably possess some interest. We may commence with our great naturalist Ray. In his earliest work, *Catalogus Plantarum circa Cantabrigiam nascentium* (1660), he records two species (1) *R. minor fructu cœruleo* [*R. cæsius* Linn.], and (2) *Rubus* [*R. discolor* W. and N.]; in his *Catalogus Plantarum Angliæ* (1670) four are recorded, viz. the same two, and *R. Idæus*, and *R. alpinus humilis* [*R. saxatilis* Linn.]; in the *Synopsis Methodica* (1690) he separates *R. saxatilis* from the other species because of its being herbaceous, placing it in the same group with *R. Chamæmorus*, thus leaving three fruticose species. To these he added in the 3rd edition of the *Synopsis* (1724) a white-fruited plant found near Oxford by Bobart, which cannot have been more than a chance variety of some species, and is not now capable of determination. It may very probably have belonged to *R. thyrsoideus* (*R. fruticosus* W. and N.); for there is a variety of that plant named "*leucocarpus*, carpellis albis" recorded by Seringe in De Candolle's *Prodromus* (ii. 561). He seems therefore not to have distinguished more than three real species. It is curious, as will be seen below, that an eminent botanist, publishing in 1858, returns to the precise view of the subject entertained in 1690 by Ray. Dillenius in his edition of Ray's *Synopsis* (1724) added a plant from Doody's manuscripts, and supposed that there was another allied to No. 2, which I have above supposed to be *R. discolor*. Owing to the short and incomplete descriptions of the earlier botanists it is very difficult to determine their plants.

The next work which is deserving of notice is Hudson's *Flora Anglica*, of which neither edition (1762 and 1778) contains more than the same species, namely, *R. Idæus*, *R. fruticosus* (*R. discolor*) and *R. cæsius:* nor do we find any addition to them before the publication of Smith's *Flora Britannica* (1800), where *R. corylifolius*[1] first appears; for Smith's quotation under it of Withering's *Botanical Arrangement* (ed. 3, 1796) is of very doubtful correctness. It seems to me that Withering, and those who preceded him, had no clear views concerning the plants, and that more than one species (probably several, as we now understand them), were confounded under the name of *R. fruticosus*, and even under its supposed variety *R. fruticosus major*. We should not, however, forget that Mr W. Hall had published, in 1794, his *R. nessensis* in the *Transactions of the Royal Society of Edinburgh* (Vol. iii.). Smith seems to have been altogether ignorant of this fact; for even in his

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[1] When Smith proposed to add *R. corylifolius* to the then meagre list of English *Rubi* it was considered as a great innovation. Dalton, a botanist of eminence in his day, wrote to Winch, Oct. 26, 1804, as follows: "I have long been an unbeliever with regard to *Rubus corylifolius*. Brunton says that he knows the plant and believes it a good species. I will talk with him on the subject and procure you a specimen from him. I have it not." Winch's *Correspondence* (*Lin. Soc. Lond.*).

English Flora he quotes Hall's paper as one with which he had no personal acquaintance. In the year 1815 Mr George Anderson gave in the *Linnean Transactions* a full description of what is usually supposed to have been Hall's plant under the far better name of *R. suberectus;* properly taking advantage of the fact that its first publisher furnished a very insufficient account of it, to replace the original name by one which avoids the great objection of being derived from that of a locality of very limited extent. Remarks upon Hall's plant will be found under *R. suberectus* in this book.

Before the appearance of the second volume of Smith's *English Flora* (1824) only a portion of the great work of Weihe and Nees von Esenbech on the German *Rubi* had been published, and Sir James expressed his grief that he was thus prevented from availing himself to a greater extent of the labours of those celebrated botanists. In the *English Flora* Smith describes eleven fruticose species; a great increase from the four recognised in his *Flora Britannica.* These plants are (1) *R. fruticosus,* which we now call *R. discolor;* (2) *R. plicatus;* (3) *R. rhamnifolius,* which includes the *R. cordifolius* of Weihe and Nees; (4) *R. leucostachys;* (5) *R. glandulosus,* now shown to be typically the *R. Koehleri* of Weihe, although it probably included some other glandular brambles; (6) *R. nitidus,* which Borrer states in the *Supplement to English Botany* (fol. 2714) to be the *R. plicatus* of the *Rubi Germanici,* at the same time informing us that "The specimens from Dr Williams, described in the *English Flora* as *R. plicatus,* bear a close resemblance to *R. rhamnifolius,* and probably belong to it;" (7) *R. affinis,* which Borrer and the late Mr Edw. Forster (*Suppl. to Eng. Bot.* f. 2605) unhesitatingly refer to *R. pallidus* of

Weihe; (8) *R. suberectus;* (9) *R. Idæus;* (10) *R. corylifolius;* and (11) *R. cæsius.*

We now turn to Lindley's *Synopsis of the British Flora*, ed. 1 (1829), where there are twenty-four species enumerated and shortly characterized in accordance with the "truly excellent Monograph of the German *Rubi* by Drs Weihe and Nees." I shall not here enter upon a discussion of these plants, for they will be found noticed under the respective species to which they are considered as referrible, but simply state that three supposed new species are recorded, viz. *R. abruptus*, now known to be a state of *R. discolor; R. diversifolius*, concerning which much discussion has arisen, either from some mistake in the naming of specimens or from the displacement of a label in the garden of the Horticultural Society[1]; and *R. echinatus*, a plant apparently ranging under *R. Koehleri.* In the second edition of the *Synopsis* (1835), Lindley quite altered his views concerning brambles; for, although he still gives short characters for eighteen plants, he states that "if it had been possible to prove the four species [*R. suberectus, fruticosus, corylifolius* and *cæsius*] to be themselves physiologically distinct," he would have then "reduced all the others" to them; but as proof even of that seemed to him to be wanting, he adopted a middle course, and grouped the species of his former edition into sections as *Idæi*, *Suberecti*, *Corylifolii*, *Cæsii*, and *Fruticosi.* He also made some alterations in the nomenclature by calling his former *R. fastigiatus* = *R. fissus*, his *R. echinatus* = *R. rudis*, his *R. pallidus* = *R. Koehleri*, and reducing a few of the other supposed species to the position of synonyms. In what is called a third edition of the *Synopsis* there is no alteration.

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[1] If specimens are to be believed this is a distinct species closely allied to *R. fuscoater;* but if the bush in the garden is the authority (although repudiated by Lindley) then it is *R. leucostachys.*

A most valuable account of the Brambles, from the pen of Mr Borrer, was published in the second (1831) and third (1835) editions of Hooker's *British Flora.* This must be considered as the groundwork upon which a real knowledge of our native species is founded, and I have derived very great advantage from its study. In the fourth and fifth editions of the *British Flora* only a very short abstract of Mr Borrer's "copious observations" will be found; in the sixth and seventh they are altogether neglected, and a note is inserted stating that the authors (for then Dr Walker-Arnott was associated with Sir W. J. Hooker in the authorship of the book) are "Almost quite convinced ...that the characters...are not permanent," and that the reputed species are not "physiologically distinct, all passing into each other without any fixed assignable limit;" and, "from a consideration of what is requisite to constitute a difference between the other Europæan species of *Rubus*, that all of the present section [the *Fruticosi*] are mere varieties approaching on the one side the *R. Idæus*, on the other to *R. saxatilis*, with both of which many fertile and permanent hybrids may have been formed, and are still forming" (*Brit. Fl.* ed. 6, p. 120; ed. 7, p. 122). This view had previously been carried out to its legitimate conclusion by Spenner in his *Flora Friburgensis* (1829), where, under the name of *R. polymorphus*, all our *Rubi Fruticosi* are combined. Spenner says nothing about hybrids, but places what he believes to be one variable species in the same rank with *R. Idæus* and *R. saxatilis.* It seems probable that this was the view also taken by Messrs Hooker and Arnott: for I cannot suppose that they believed the plants to be hybrids between *R. Idæus* and *R. saxatilis.* It is admitted by zoologists that hybrids are of exceedingly rare occurrence when animals are left to their natural instincts, although they are not unfrequent between domesticated species: also, that it is in the highest degree doubtful if a really hybrid race exists even in domestication. Is it likely that less care would be taken to keep the species of plants free from intermixture than is believed to have been exercised in the animal kingdom? Certainly a few fertile hybrids have been obtained artificially, but all the experiments, accounts of which have fallen in my way, tend to show that even if isolated they revert to one or other of the parent species in a few generations. As Fries has more than once remarked, to affix the stigma of hybridity is a convenient mode of escape from many difficulties, but it is not therefore the more likely to be just. "Ad hybriditatum voluptas trahit omnes, (1) qui de specierum limitibus dubii rem absolutam fingunt: 'videtur hybrida planta;' (2) qui omnes recentius distinctas species ex arbitrio delere student: 'est hybrida forsan planta;' (3) quibus pravas ut species tueantur, necesse est manifestos transitus 'pro hybridis formis' declarare. At cum hybridas suas species haud limitare valent, ulterius hybriditates hybriditatum tertii, c. s. p. gradus urgent" (*Fries Symbolæ ad Historiam Hieraciarum,* p. xxxii.). In the eighth edition of the *British Flora,* the authors state their belief that the British fruticose species "might be advantageously reduced to five...which five would then accord with the four sections into which Mr Babington has now divided the group."

In the above-mentioned editions (2nd and 3rd) of Hooker's *British Flora,* Borrer adds only two to the species already recognized by Smith, although the names of several are corrected, and the characters very much improved; they are *R. carpinifolius* (which is not that so named by the German authors, but seems to be very closely allied to *R. Grabowskii*), and *R. macrophyllus.*

In 1837 Professor David Don drew up a very concise account of these plants for Dr Macreight's *Manual of British Botany.*

In 1841 Leighton published his *Flora of Shropshire,* in which he endeavoured to determine the plants of Nees von Esenbech, Lindley, and Borrer, by transmitting specimens of the Shropshire Brambles to each of them, and obtaining in return their remarks upon the plants. The results are not as satisfactory as might have been expected; for the opinions received are very contradictory, and appear sometimes, especially in the case of the first-named author, not to accord with the descriptions previously published. In 1848 Leighton made a series of most valuable remarks upon some of the same plants in the third volume of the *Phytologist.* Unfortunately his intention of sending further papers on the subject was not fulfilled.

In 1847 Mr Edwin Lees communicated the specific characters of the species, as known to him, to Steele's *Handbook of Field Botany;* and more recently described many of them in his own *Botany of Malvern,* ed. 2 (1852).

Dr Thomas Bell Salter inserted valuable remarks upon these plants in the *Annals of Natural History* (Ser. 1. xv. and xvi. in 1845), and in the *Phytologist* (ii.). He gave a complete synopsis of his views in the *Botanical Gazette* (ii. in 1850), and repeated it, with little or no alteration, in Hooker and Arnott's *British Flora* (ed. 6. in 1850), and Bromfield's *Flora Vectensis* (1856).

In 1846 the author of this book published in the *Annals of Natural History* (Ser. 1. xvii.), and also in a separate form, a *Synopsis of British Rubi*, adding in the same journal supplements to it in 1847 (Ser. 1. xix.), 1848 (Ser. 2. ii.) and 1852 (Ser. 2. xx.), and has given the characters of all the species supposed to inhabit Britain in the successive editions of his *Manual of British Botany* (1843, 47, 51, 56, 62, and 67).

In 1850 the Rev. Andrew Bloxam supplied to Miss Kirby's *Flora of Leicestershire* a very excellent account of the species which he had ascertained to grow in that county.

In 1851 the Rev. F. J. A. Hort published a new species (*R. imbricatus*) in the *Annals of Natural History* (Ser. 2. vii. 374).

In 1853 Dr George Johnston included several brambles in his elegant *Botany of the Eastern Borders*, and mentions the curious fact that the vicar of Norham received tithes of Blackberries (Rubi majores) in the year 1364 (Raine's *North Durham*, 278).

In 1858 Mr Bentham published his *Handbook of the British Flora*, wherein he reduces our *Rubi Fruticosi* to three, viz. *R. Idæus*, *R. fruticosus*, and *R. cæsius;* thus including all of them, except *R. Idæus* (which comprises *R. Leesii*), under two species. He states it to be his opinion that the supposed series, even when thus restricted, will "very frequently be found to pass imperceptibly into each other." Had not the plan of his whole work been founded upon a similar principle, this might have been considered an easy way of appearing to escape from a difficulty.

Mr Irvine included the *Rubi* in his *Illustrated Handbook* in 1858, and states in the Preface that they are described "in conformity generally with Mr Babington's views."

Unfortunately I must decline being considered as at all answerable for most of the statements there made.

Two species are characterized for the first time in Britain in my *Flora of Cambridgeshire* (1860), viz. *R. althæifolius* and *R. tuberculatus*.

Mr Syme in the "new edition" of *English Botany* has followed my arrangement, calling my species sub-species. Only some of the plants thus ranked as sub-species are represented on the plates, most of those remaining without figures which have not been published in the original *English Botany* or its *Supplement*. Unfortunately the want of attention to the colour and clothing of the leaves which exist in the originals of these plates has not been supplied in this new work.

In 1867 Mr Lees published his *Botany of Worcestershire*, at the end of which he has given his latest views upon the species of *Rubi*. In many respects these accord with my ideas, but in some cases his nomenclature is different, and in others the plants which he had in view are apparently not always the same as mine.

It is believed that this is a tolerably complete account of the progressive study of British Brambles. No attempt is made to treat the writings of continental botanists in a similar manner, but I may name those authors whose works have been of the most use to me in my researches. They are Arrhenius, by his *Monographia Ruborum Sueciæ* (1840); and his notes inserted in Fries's *Mantissa tertia* (1842) and *Summa Vegetabilium Scandinaviæ* (1846); Bluff and Fingerhuth, in the *Compendium Floræ Germanicæ*, ed. 1 (1825) and ed. 2 (1837); Petermann, in his *Flora Lipsiensis* (1838); Godron, in his *Flore de Lorraine*, ed. 1 (1843), ed. 2 (1857), the *Flore de France* (1848), and his *Monographie des Rubus* *de Nancy* (1843); and the following works are especially deserving of notice, viz. the *Rubi Germanici* of Weihe and Nees v. Esenbech (1822—27); the *Flore du centre de la France*, by Professor Boreau, edition 3 (1857); a valuable paper by Dr Metsch entitled *Rubi Hennebergenses*, which will be found in the *Linnæa* (xxviii. p. 89), published in 1858, although dated 1856 on the title-page; and Garcke's *Flora von Nord- und Mittel-Deutschland*, ed. 7 (1865).

An interesting history of the study of this genus on the continent will be found in Godron's paper entitled *Le genus Rubus considéré au point de vue de l'espèce.* It is included in the *Mémoires de la Société des Sciences de Nancy* (1849, p. 210), and contains some exceedingly good remarks upon the distinctness of species in opposition to those botanists who with Gmelin and Bentham only recognize the Linnæan species, or with Spenner admit only one fruticose *Rubus* into the flora of Europe. He shows that neither climate, soil, nor variations of light and shade, nor even cultivation, will produce those changes in the form and direction of the stem, the shape and texture of the leaves, the outline and structure of the panicle, the shape of the petals, and the kind of fruit, which are requisite if the theory of the authors just mentioned is adopted. An essay entitled *De l'étude specifique du genre Rubus* (*Congrès Scientifique de France*, 28 Session, t. iii.) by the Abbe Chaboisseau, is a valuable contribution to the literature of this subject.

I may also refer to the Essays of M. Genevier contained in the *Mém. Soc. Acad. d'Anger* (vols. viii. and x.), and the *Rubi Genevenses* of Dr Mercier attached to Reuter's *Flore de Genève.*

INTRODUCTION.

In the study of *Rubi* it is requisite to take into consideration the habit of the plant, as well as the form and structure of most of its parts. A want of information in the first of these respects renders it most difficult and often impossible to refer dried specimens to their true species with certainty[1]. All the fruticose species throw out long leafy shoots directly from their roots which do not produce any flowers during the first year. The *Idæi* are sometimes exceptions, for their canes (as the gardeners call them) do sometimes flower at the end in the first autumn. The barren stems, as they are usually called, all rise slightly from the ground at the commencement of their growth, but afterwards take different directions which are characteristic of the several species. They are either (i) *suberect*, that is, nearly upright throughout the greater part of their length but nodding slightly at their slender tops; or (ii) *erect-arcuate*, when they are nearly as erect as in the suberect species, but terminate often in a kind of knot consisting of a number of closely placed leaves and usually numerous prickles, from which in the autumn one or more slender shoots descend directly to the ground, where they take root. The other species form an arch of more or less height and extent, but when the shoot again arrives at the ground (if early enough in the season) it is prostrate for some distance, and in the autumn again rises at the end into a very low and small arch so as to present its point directly toward the earth, which it penetrates slightly and takes root. It is convenient to divide these plants into such as are (iii) *arcuate*, that is form a large and lofty arch the end of which often does not reach the earth until late in the autumn, when its point immediately pushes itself into the ground and takes root; and the (iv) *arcuate-prostrate*, whose stems, when unsupported, form a very slight and inconspicuous arch, but lie, throughout the greater part of their length, quite close to the ground, often following all the slight inequalities of its surface. The observation of these differences is rendered difficult by the stems being supported by bushes or even by other parts of the plant itself and not reaching the ground, as they would have done if without support. We often see *R. discolor*, which is an arcuate-prostrate plant, rising out of the tops of lofty hedges, and sometimes rendered unable to reach the ground before its growth is stopped by the winter. When thus circumstanced it lies upon the top of the hedge in precisely the same manner as it would have done upon the ground if not artificially raised. When so prevented from taking its more natural position it frequently forms a knot similar to that of the erect-arcuate plants, and tries by throwing out a slender autumnal shoot to arrive at the earth; or extends its growth from the same point during the succeeding summer, frequently, if the thicket is dense, with a like failure: but where such supports are wanting, its stem will be found to form an arch of only a few inches in height, after which it extends to a great length close to the ground, until the final small autumnal arch is produced by means of which the growing point is enabled to bury itself. On the other hand, its ally *R. thyrsoideus* forms a lofty arch even when totally without other support than its own strength, and generally takes root as soon as the end arrives at the soil, never running far along the surface.

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[1] Caulis in multis plantis ita essenciales præbet differentias, ut eo demto, nulla certitudo speciei. *Linn. Philos. Bot.* § 276, ed. 2, p. 218.

The stem is round or has five bluntish angles, between which the faces, although often furrowed, are usually nearly flat. Sometimes the lower part is round and the upper angular. The colour of the stem, as is well remarked by Arrhenius (p. 9), is variable according to the place where the plant grows. In shade it is green or greenish, in spots where it is fully exposed to the light of the sun it usually becomes more or less red or purple, and often acquires a very dark tint of the latter colour; but some species seem to have a greater tendency to assume the dark tint than is possessed by others. The prickles are uniform in shape and direction throughout the stem; or the lower ones are straight and slender, but the rest much stronger, and either patent (that is, at right angles to the stem) or deflexed or declining (when they are straight, but directed downwards). In some species they are all of nearly equal size and placed chiefly or wholly upon the angles of the stem; in others they are very variable in size and scattered over the faces as well as the angles. In the latter case there is usually a very gradual decrease in their size, so that the smallest prickles are not distinguishable from the slender rigid bristles called *aciculi*. The *aciculi* again decrease in strength, and each becomes tipped with a gland, when they take the name of setæ[1].

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[1] The term *seta* is usually applied by botanists to a strong bristle, but English writers upon the genera *Rubus*, *Rosa* and *Hieracium* confine

The faces of the stem are often furnished with many nearly sessile glands in some of those species which usually have neither setæ nor aciculi. Some stems are quite hairless; but others are more or less thickly covered with hairs, which are either solitary and patent, or two or three spring from the same spot and diverge so as, if numerous, to interlace with those of the neighbouring clusters. In some cases there is more or less fine down, formed of clustered but very small hairs spreading close to the surface of the stem; this is called *felt*, *tomentum*, or *stellate-pubescence.* The stem of a few species is covered with a kind of bloom (is *pruinose*), especially when young. The faces of the stem in the groups called *Suberecti*, *Rhamnifolii* and *Villicaules*, are usually marked with parallel longitudinal lines and have a dull appearance; but a few plants (*R. Lindleianus* for example) have shining faces to their stems.

The leaves are either *pinnate* with seven leaflets, of which four spring from the same spot in opposite pairs, but the upper three (also seated at one spot) are separated from them by a considerable space; or, the upper three consist of an opposite pair similarly separated from the lower four, but the terminal leaflet is again raised above them by a short stalk; both of these combinations are called *septenate-pinnate* leaves: or, (in *R. Idæus*) five leaflets are arranged in an *impari-pinnate* manner: or, the leaf consists of three or five leaflets, all springing from the same place, of which the lower are stalked or sessile, but the terminal is always stalked; these are the *quinate* leaves: or, the two lower are

it (in describing those plants) to the *longish gland-tipped hairs.* Some confusion is caused by this latter use of the term, but, in the want of a special name for those organs, it is probably better to retain its use than to employ the circumlocution of *gland-tipped hairs;* for descriptions are thereby much shortened and facilitated.

placed severally upon the stalks of the two intermediate leaflets, when the leaf is *pedate.* The *septenate-pinnate* leaf is always distinguishable from that which is truly pinnate by the four lower leaflets being, as is already remarked, inserted at the same spot, and also by the unequal bases of the upper pair, which are very irregularly combined with or separated from the terminal leaflet. Thus the septenate-pinnate leaf is nothing more than an anomalous state of the quinate leaf. Nevertheless it is very rarely found except in three or four of the species. Similarly the *pedate* is perhaps to be considered as a state of the ternate leaf: for it appears to be tolerably certain that the ternate and pedate leaves are interchangeable in the same species, or even individual bramble. The true *quinate* leaf is always digitate, and its leaflets are also always distinct from each other, although the lower or outer pair are sometimes sessile.

The upper surface of the leaflets is usually rather darker in colour than the under side; it is either quite naked, or has a few hairs scattered over it or arranged along the grooves which correspond with the ribs and stronger veins of the under side. The under side is either green, and naked with the exception of more or less dense rows of hairs placed upon the ribs and stronger veins, or even also upon the finer veins; or the surface between the veins, and often the veins themselves, is covered with white or whitish felt (*tomentum*), which is sometimes very fine, but often forms rather a thick and dense coat quite hiding the cuticle. The midribs of the leaflets, and the partial and general petioles, are armed on the under side with prickles taking generally the form of hooks. In describing the leaflets, unless the contrary is expressed, the terminal one alone is noticed; it is usually more or less obovate, often cordate at the base, and frequently acuminate at the tip: but some leaflets are strongly cordate below, and some are abruptly cuspidate. The form, although speaking generally it may be called obovate, is sometimes so much and regularly narrowed below as to become almost wedgeshaped, or it may narrow so slightly as to be very nearly oval, or, in a few cases, the sides are so parallel and the two ends so truncate that the leaflet is almost square, with a central terminal cusp. Many intermediate forms are found to which attention should be paid. In some leaves the lower pair of leaflets partially overlaps the intermediate and, rarely, the latter overlap the terminal leaflet; or, the lower leaflets are directed backwards, toward the petiole, so as to leave a clear space between them and their neighbours. Those differences in the direction of the leaflets are usually constant and therefore deserving of attention; but in some species they are not wholly to be depended upon. It is often very difficult to determine what has been the direction of the leaflets after the specimen has been pressed in preparation for the herbarium. The whole leaf is convex, flat, or concave above, and the edges of the leaflets are either similarly curved or flat; or, the whole leaf may be flat and the edges of the leaflets may curve upwards or downwards so as to be concave or convex. The edges of the concave leaflet are usually wavy. The leaflets are sometimes simply and finely dentate or serrate or doubly so; or the double teeth are so large, especially in the upper half of the leaflet, as to resemble dentate or serrate lobes. These lobes are either directed towards the end of the leaf or their tops turn more or less from it: this seems to be a difference of some value, for there are cases in which individuals belonging to species which usually have well-marked lobed dentition have the lobes reduced to very broad but low double teeth, and then the middle secondary tooth of each of them usually shows a clear tendency to take the forward or the patent direction observable in the typical forms.

The general and partial petioles are flat or furrowed on their upper side and rounded below. Their under sides are also furnished with more or less numerous prickles similar to, but usually rather larger than, those found on the under side of the midrib of the leaflets.

In all the fruticose species the stipules are attached to the petiole at some little distance from its insertion; but herbaceous *Rubi* have their stipules attached to the stem itself. In this respect *R. saxatilis* seems to connect these great divisions, for the stipules of its barren stem are often on the petioles, whilst those of the flowering shoot spring from the stem itself.

The *flowering shoot* grows from buds formed in the axils of the leaves of the barren stem of the preceding year; excepting in some of the *Herbacei*, where the stem is represented by a subterranean creeping rhizome, from which the flowering shoots rise at intervals. Therefore the only difference consists in the fact that the *Fruticosi* have aërial, the *Herbacei* subterraneous stems. The scales which formed this bud are persistent, in a faded condition, at the base of the shoot: they vary in colour, and in their clothing, and may furnish characters of some value when carefully noticed. In the *Idæi* and *Suberecti* the shoots spread in two directions (are distichous), but in the other *Fruticosi* they all turn towards the upper side of the stem. Their leaves are very similar to those of the stem, but much more frequently ternate; the lower are sometimes quinate; and the upper floral leaves are frequently simple.

The panicles are of various forms; their branches are either racemose or corymbose, and they, as well as the peduncles, spread at different angles. Characters derived from them are not easily described, and therefore are of less value to the student than they seem really to be in nature. The rachis and peduncles, and often the whole of the flowering shoot, are usually furnished with setæ (even in species the stems of which have no such organs), often have aciculi, many hairs, and frequently a thick coat of felt. The setæ on these parts are sometimes shorter than the hairs (sunken), and may easily be overlooked when not pointed out by their peculiar colour. The sepals are usually clothed similarly to the peduncles; they differ considerably in shape and direction when accompanying the fruit. They either end in a minute point, or a linear or flattened and leaf-like appendage. In considering the characters derived from this appendage, it is its presence, not absence, that is supposed to be of value. For those plants which usually possess the leaf-like point, often only produce it on the calyx of the primordial flower, which terminates the panicle, and even there it is not always to be found. This uncertainty renders it of much less use than, from its apparent value, it ought to possess.

Arrhenius and Godron state that the petals furnish most valuable characters. It unfortunately happens that they have not received so much attention in England as it is probable that they deserve. They are sometimes very broad so that their edges overlap; or may be so narrow as to be quite separate from each other, and to give a star-like appearance to the flower: they are broad to the base, or wedge-shaped; rounded at the end, or lanceolate; entire, or notched at the end; wavy at the edges, or throughout, or plain. In colour they are most frequently white, although often pink, or even sometimes reddish.

The colour of the filaments and anthers and styles deserves much more notice than we have given to it. It is apparently constant in tint, although very variable in intensity.

The fruits are formed of many small drupes placed close together and usually cohering. They are seated upon a receptacle, which is conical in all except the herbaceous species, and either falls with the fruit, or remains attached to the stalk after the fruit has separated from it, but amongst our species this latter condition exists in the *Idæi* alone. I have not found that the seeds afford any characters of importance. As Arrhenius places confidence in their form, it is desirable that attention should be paid to them[1].

If a bramble is found to retain the same appearance under different circumstances of soil and exposure, although many of its characters vary considerably, we may conclude that it is a true species, and form some idea of its range of variation: but when a plant, although furnished with rather marked characters is confined to a single spot, we properly doubt its specific claims, although necessity may oblige us to allow it to stand alone, from not knowing with what other plants it should be combined. No study in herbaria can supply the knowledge requisite for a determination of the range of variation in these plants. Unfortunately our information on this subject is rarely sufficient to give confidence to our determinations. The recorded geographical distribution of a species is often far from telling the whole truth: it may seem to show that a plant is confined to a single spot, or nearly so, and thus cause just doubts concerning its being a distinct species; whereas, in reality, it is so abundant in that place, and under such various circumstances, that its claim to be considered as a distinct species may be held to be well founded. For instance, *R. pyramidalis* seems, by the geographical table, to have been found in three or four localities, separated by long distances, and would probably have been considered as a doubtful species, had not its extreme abundance in the valley of Llanberis attracted especial attention to it, and shown that its limits of variation are narrow, and that it presents a clearly distinct appearance (facies), and also admits of an accurate definition.

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[1] The following very curious description of the fruit of *Rubus* is to be found in *Linnæi Amœnitates Academicæ* (viii. 170): "*Rubus*, fructu suo singularis admodum est: Receptaculum enim seminum quasi duplici epidermide obducitur, intra quam succus et semina latent, adeoque decidit hæc bacca concava instar pilei." It is probably the description of the student (Sveno Anders Hedin, who defended it under the presidency of Linnæus on May 26, 1772, at Upsala), not of the Professor. Linnæus adopted the genus from Tournefort, who described the fruit correctly in his *Institutiones Rei Herbariæ* (ed. 3. 614. t. 385).

Some botanists have ventured to state that the seeds of Brambles do not readily germinate, that therefore we seldom see a seedling, and that thickets of these plants are almost wholly derived from the rooted ends of the stems. Careful observation has proved to me that the exact opposite is the fact, that the seeds germinate freely, and that seedlings are easily found in abundance by those who search for them in the proper places.

Mr H. C. Watson informs me that Brambles are sown by the birds in his grounds at Thames Ditton, and that abundant seedlings appear, and have to be carefully removed; and that that is also the case in his hedges, which he has known from the time of their being planted more than thirty years since. During the whole of that time seedling *Rubi* have frequently sprung up here and there in the hedgerows, although they are never allowed to fruit, and the roots are removed every winter as completely as possible.

More than forty of the supposed species have been raised from seeds in the Cambridge Botanic Garden, and the produce has not varied in form or characters from the parent plants. The seeds were sown in the autumn, and the young plants usually appeared in the succeeding May or June. The seedlings have two little oval cotyledons, and produce a small cluster of simple leaves in the course of the first summer. In the second summer short slender shoots spring from the terminal bud and the axils of the leaves in the cluster and bear ternate or sometimes a few quinate leaves. In the third summer these shoots bear small panicles; and the root throws up the strong stems of adult plants, which, in the fourth summer, bear the perfect panicles proper to the species. Although most of the stems die down to their base after they have produced panicles, that is far from being constantly the case when the stem has not succeeded in rooting at its end. It may continue to live for many years, throwing out secondary and tertiary stems, which bear panicles. But when it has rooted, only the lower part seems able to survive the succeeding winter, and the new plant formed at its end becomes detached.

On the other hand, some persons fancy that the inclination of these plants to produce fertile seeds is so strong as to result in abundant hybridity; and by that, combined with increase of the individual by offsets, they account for the many forms which are found in the genus. It is my belief that this latter view is also unfounded; and that the production of hybrids is as repugnant to Brambles as it is to most other plants. Those who adopt this view make no attempt at proof. As has been already remarked, the assumption of hybridity in difficult cases seems merely a mode of escape from, not the removal of, a difficulty. It is often nothing more than the concealment of ignorance under a bold exterior. I believe in the distinctness of species, although unable to demonstrate it. The great length of time requisite for experimental proof, the only kind which could result in a real demonstration, renders the absolute determination of this problem nearly impossible. Perhaps the most extreme instance of the attempt to explain everything by hybridity will be found in the *Reform Deutscher Brombeeren* of Otto Kuntze (Leipzig, 1867), where all the recorded German brambles are reduced to *R. fruticosus* L. (= *plicatus*, *affinis*, and *nitidus*, of W. and N., and *corylifolius* of Hayne), *R. candicans* Weihe (= *fruticosus* W. and N., and *thyrsoideus* Wimm. in part), *R. sanctus* Schreber (= *discolor*, *villicaulis*, *carpinifolius*, and *Schlechtendalii* of W. and N.), *R. Idæus* L., *R. cæsius* L., *R. Radula* Weihe, *R. hybridus* (= *pygmæus*, *glandulosus*, *Koehleri*, *Hystrix*, *humifusus*, *rosaceus*, and a host of others), *R. saxatilis*, and *R. Chamæmorus*. In addition there are 23 supposed hybrid plants: but in many cases the supposition seems to me to be very rash, for in this country the supposed parents have not been observed growing in company.

Dr Lejeune and also M. Alexis Jordan have cultivated brambles extensively and raised them from seeds. They find that the character of the species continues constant even after repeated sowings. The Abbé Chaboisseau justly remarks that it would require a century or more to be spent in experiments by cultivation from seed to attain to any certain result. He adds: 'L'habitant des grandes villes, condamné à étudier beaucoup plus en herbier que sur le nature vivante,

se fait de l'espéce une idée tout autre que l'observateur placé au milieu des champs. Il se forme de chaque espèce un type ideal plus au moins large, selon le nombre et les états des spécimens qu'il a pu voir dans les herbiers." *L'Étude specifique du genus Rubus.*

In the attempt that is made to point out the geographical distribution of the species I have been obliged to trust chiefly to my own collection for information; for in the present uncertain state of the nomenclature of brambles it is not advisable to accept the names given even by the best botanists. The tables show the presence of the several species in certain parts of the country; but do not, and cannot, point out their abundance or rarity in any place. This is an unfortunate circumstance, for, as has been already indicated, much depends upon it. In illustration: *R. discolor* and *R. Radula* are equally marked as natives of Prov. III. *Ouse* and county of Cambridge. The former is exceedingly abundant; the latter has only been found in one place. It seems probable that one or more of the species constitutes the prevalent bramble, the Blackberry, of each district. *R. discolor*, which is very common in many parts of the kingdom—so abundant as to attract notice almost exclusively to itself—is superseded by another kind in some places, where it may be and probably is present, but escapes general notice. *R. diversifolius* is so abundant in the valley of the Severn at and for a long distance above Shrewsbury, and *R. pyramidalis* and *R. incurvatus* at Llanberis, as to be noticed by any observant person; but *R. discolor* is not seen except by the botanist who is familiar with brambles.

The eighteen *Provinces* into which Mr H. C. Watson divided Great Britain, and which are used in his *Cybele*

Britannica, are here adopted with the same numerical arrangement as is employed by him. His 112 Counties and Vice-counties (*Cyb. Brit.* iii. 526—528) are also used. It has likewise seemed desirable to give such imperfect information as has been obtained relative to the distribution of these plants in Ireland; I have therefore divided that country in a similar manner. This division of Ireland was first proposed in a communication read to the "Dublin University Zoological and Botanical Association," and published by that body in the original (Dublin) *Natural History Review* (vi. Pt. 2. 533), and in the *Proceedings* of the Association (i. 246); but as those works may not everywhere be easily accessible, a list of the *Provinces* and *Counties* or *Vice-counties* of Ireland is subjoined. The numbering is continuous from Mr Watson's similar divisions (*Cybele Britannica*, iii. 526).

Provinces.

XIX.	South Atlantic.	XXV.	Upper Shannon.
XX.	Blackwater.	XXVI.	North Atlantic.
XXI.	Barrow.	XXVII.	North Connaught.
XXII.	Leinster Coast.	XXVIII.	Erne.
XXIII.	Liffey and Boyne.	XXIX.	Donegal.
XXIV.	Lower Shannon.	XXX.	Ulster Coast.

Counties and Vice-counties.

XIX. South Atlantic.

113. South Kerry.
114. North Kerry.
115. South Cork.

XX. Blackwater.

116. North Cork.
117. Waterford.
118. South Tipperary.

XXI. Barrow.
119. Kilkenny.
120. Carlow.
121. Queens.

XXII. Leinster Coast.
122. Wexford.
123. Wicklow.

XXIII. Liffey & Boyne.
124. Kildare.
125. Dublin.
126. Meath.
127. Louth.

XXIV. Lower Shannon.
128. Limerick.
129. Clare.
130. East Galway.

XXV. Upper Shannon.
131. North Tipperary.
132. Kings.
133. West Meath.
134. Longford.

XXVI. North Atlantic.
135. West Galway.
136. West Mayo.

XXVII. North Connaught.
137. East Mayo.
138. Sligo.
139. Leitrim.
140. Roscommon.

XXVIII. Erne.
141. Fermanagh.
142. Cavan.
143. Monaghan.
144. Tyrone.
145. Armagh.

XXIX. Donegal.
146. Donegal.

XXX. Ulster Coast.
147. Down.
148. Antrim.
149. Derry.

As a few of the larger counties are divided into two Vice-counties the lines used for that purpose must be described.

Kerry is divided into North and South by a line which follows the course of the river Flesk from the place where it enters the county to its mouth in the Lower Lake of Killarney, then skirts the northern shore of that lake as far as the river Laune, which it descends to the sea. *Cork* is separated into North and South by a line descending the river Sullane from its entrance into the county to its junction with the river Lee, and then following the course of that river to the sea. *Tipperary* is conveniently divided into North and South by the Great Southern and Western Railway. In *Galway* the division into East and West is well defined by Lough Corrib and the river which flows from it. In *Mayo* a boundary between the East and West is also tolerably well marked by Lough Mask and the course of the river Ayle as far as a small lake above Ballyhean church; from thence it is imaginary for a short distance until it reaches the road from Tuam to Castlebar close to a hamlet called Tully; then it follows that road as far as Castlebar, and from thence descends the course of the water through Lough Cullin and by the river Moy to the sea near Ballina.

This division into Provinces has been adopted by Messrs. Moore and More in their *Cybele Hibernica*, but they have not thought it desirable as yet to attempt determining the distribution of the plants under the Counties separately.

One inconvenience of the tabular form has already been mentioned, another is that it does not give a very satisfactory idea of the extent to which the country has been examined. For instance, Provinces vi. *South Wales*, and vii. *North Wales*, seem to be tolerably known; but in fact only very small parts of them are in that condition. Few or no *Rubi* are recorded from the counties of Glamorgan, Brecon and Caermarthen, in S. Wales; or from Denbigh, Flint and Anglesea, in N. Wales. Also it is only some small parts of the other counties that have been examined; viz. spots where a botanist interested in brambles has been able to reside for a considerable time.

The Fruticose Rubi do not ascend to a great elevation above the level of the sea. Mr Watson (*Compend. of Cyb. Britan.* 19) considers their upper limit to be in his *Superagrarian zone*, which is characterized by the presence of *Quercus*, *Fraxinus*, *Lonicera* and *Cratægus*, and by the presence of *Pteris* without *Rhamnus*.

In the vale of Llanberis in North Wales 600 feet is about the height at which they appear to cease. Below that elevation they are immediately plentiful; above that I only noticed one bush. (*R. discolor*), which was growing under a wall at the great height of 1000 to 1100 feet; but as no others occurred, its existence there was probably the result of accident. ·Mr Lees (*Bot. of Worcest.* p. 142) states that "In general *Rubi* delight in hilly spots of moderate height, becoming prostrate...at above 2000 feet of elevation, but descending and luxuriating even on the sands of the sea-shore." It is therefore possible that the elevation which my observation has led me to adopt as the upper limit of their growth is too small, especially as Mr H. C. Watson gives 900 ft. as the highest point at which they are found in the West Highlands of Scotland, and Mr Baker about the same elevation in the Humber and Tyne Districts. It would be interesting to ascertain if the *R. suberectus* which Mr Lees informs me that he found near "Gors Lwm on Banwen" Mountain in Glamorganshire, at an elevation of about 2000 feet, is the true plant, or is not rather the *R. fissus*. I have never noticed *R. suberectus* on exposed spots such as that must be, but have often seen *R. fissus* on open mountain sides, although never at so great an elevation. *R. fissus* is the *R. suberectus* of many recorded stations, especially of those in Scotland.

To judge properly of a bramble from a preserved specimen we require a piece of the middle of the stem with more than one leaf; the base and tip of the stem are also desirable. Likewise a piece of the old stem with the flowering shoot attached to it; the panicle with flowers, and the fruit. We likewise want to know the direction of the stem throughout, of the leaflets, and of the calyx; also the shape of the petals and the colour of the styles: a note of these should be made when the specimen is gathered.

In quoting the works of different authors I do not hold myself responsible for the correctness of all the synonyms given by them. In some cases I have no doubt of their incorrectness, but do not possess any absolute proof of it.

The localities for each species are with comparatively few exceptions founded upon specimens preserved in my own Herbarium. When such is not the case the authority is added within brackets and a (!) appended wherever I have seen a specimen. But as many of these latter have not been recently seen I must not be considered as now guaranteeing their absolute accuracy.

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THE BRITISH RUBI.

Nat. Ord. ROSACEÆ.

Subord. ROSEÆ. Tr. DRYADEÆ.

Rubus Linn.

Calyx explanatus, limbo 5-partitus, ab ovariis discretus, persistens. *Petala* quinque, calyci inserta. *Stamina* indefinita, cum petalis inserta. *Ovaria* plura, receptaculo convexo imposita, unilocularia. *Stylus* subterminalis, filiformis, brevis; stigma simplex. *Acini*[1] succosi, receptaculo protuberante exsucco impositi, monospermi, basi inter se confluentes. *Semen* inversum, prope basin styli affixum; radicula supera.

Stems herbaceous, or more frequently rather shrubby, erect, or ascending or trailing, generally prickly, leafy, angular or nearly round, often rooting at the end, rarely more than biennial. *Leaves* alternate, stalked, digitate or impari-pinnate or ternate, rarely simple. *Stipules* adnate to the petiole or springing from it. *Flowers* terminal and axillary, in the shrubby species forming racemes, panicles or corymbs, which spring from shoots produced by the stems of the preceding year. *Calyx* without bracteoles. *Petals* deciduous, white or reddish. *Inflorescence* centrifugal.

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[1] *Acinus* est bacca mollissima, succulenta, subtransparens, constanter unilocularis, et seminibus duris, uno aut pluribus referta. Gaert. *de Fructibus*, v. 1. xcvi.

SEC. I. RUBI FRUTESCENTES.

Caules suffruticosi. *Folia* subquinata. *Stipulæ* lineares ad basin petiolorum affixæ. *Flores* subpaniculati. *Acini* in baccam polyspermam compositam congesti. *Receptaculum* conicum.

Subsec. I. IDÆI. *Caules* steriles suberecti biennes. *Receptaculum* a fructu discretum. *Folia* sæpissime pinnata.

1. R. Idæus *Linn.*
2? R. Leesii *Bab.*

Subsec. II. FRUTICOSI. *Caules* biennes vel perennantes. *Receptaculum* ad fructum adherens et cum eo desidens. *Folia* digitata, pedata, vel rarissime subpinnata.

i. *Suberecti.* Caules sæpissime suberecti, glabri vel sparsim pilosi vel pruinosi, nec setosi neque tomentosi. Aculei æquales.—Sepala intus albo-tomentosa, extus pilosa margine albo-tomentosa.

3. R. suberectus *Anders.*
4. R. fissus *Lindl.*
5. R. plicatus *W. & N.*
6. R. affinis *W. & N.*

ii. *Ramnifolii.* Caules plus minusve arcuati, sparsim pilosi, nec pruinosi nec setosi neque tomentosi, radicantes. Aculei in caulis angulis sæpissime congesti, subæquales.—Sepala extus tomentosa.

7. R. Lindleianus *Lees.*
8. R. rhamnifolius *W. & N.*
9. R. incurvatus *Bab.*
10. R. imbricatus *Hort.*
11. R. latifolius *Bab.*

iii. *Villicaules.* Caules plus minusve arcuati, pilosi vel calvati, sæpe tomentosi, glandulis subsessilibus; vel raro setosi aciculatique. Aculei in caulis angulis congesti, subæquales; vel paucis minoribus sparcis. Foliola infima petiolata intermediis dissita (*R. Grabowskii* excepto).

a. *Discolores.* Caulis aculei æquales validi, pubescentia arcte adpressa. Folia subtus cano-tomentosa.

12. R. discolor *W. & N.*
13. R. thyrsoideus *Wimm.*

b. *Sylvatici.* Caulis aculei æquales mediocres, pili patentes sæpe densi. Folia subtus virides vel raro cano-tomentosa.

14. R. leucostachys *Sm.*
15. R. Grabowskii *Weihe.*
16. R. Colemanni *Blox.*
17. R. Salteri *Bab.*
18. R. carpinifolius *W. & N.*
19. R. villicaulis *W. & N.*
20. R. macrophyllus *Weihe.*

c. *Spectabiles.* Caulis aculei subæquales, setæ et aciculi breves perpauci, pili sæpe densissimi.

21. R. mucronulatus *Bor.*
22. R. Sprengelii *Weihe.*

d. *Radulæ.* Caules punctis elevatis rigidis, ubi setæ aciculique breves subæquales sederunt, asperi efficiuntur; aculei subæquales.

23. R. Bloxamii *Lees.*
24. R. Hystrix *Weihe.*
25. R. rosaceus *Weihe.*
26. R. pygmæus *Weihe.*
27. R. scaber *Weihe.*
28. R. rudis *Weihe.*
29. R. Radula *Weihe.*

iv. *Glandulosi.* Caules arcuato-prostrati vel prostrati, radiantes, hirti. Aculei copiosi, valde inæquales, sparsi, in aciculos setasque copiosos graduatim adeuntes.

a. *Koehleriani.* Folia quinata vel raro ternata. Aculei aciculi setæque ad basin incrassati.

30. R. Koehleri *Weihe.*
31. R. fusco-ater *Weihe.*
32. R. diversifolius *Lindl.*
33. R. Lejeunii *Weihe.*

b. *Bellardiani.* Folia ternata vel raro quinato-pedata; foliola infima intermediis dissita, pedicellata. Aculei in caulium aciculatorum setosorum valde hirtorum angulis sæpissime congesti.

34. R. pyramidalis *Bab.*
35. R. Guntheri *Weihe.*
36. R. humifusus *Weihe.*
37. R. foliosus *Weihe.*
38. R. glandulosus *Bell.*

v. *Caesii.* Caules sæpissime arcuato-prostrati, teretes vel subangulati, pruinosi. Aculei inæquales. Aciculi setæ pilique pauci vel nulli.

39. R. Balfourianus *Blox.*
40. R. corylifolius *Sm.*
41. R. althæifolius *Hort.*
42. R. tuberculatus *Bab.*
43. R. cæsius *Linn.*

SEC. II. R. HERBACEI.

Caules herbacei. Folia ternata vel simplicia. Stipulæ ovatæ cum petiolum caulem amplectens. Flores umbellati vel subsolitarii. Receptaculum planum.

Subsec. I. SAXATILES. Caules flagelliformes. Flores umbellati vel subsolitarii. Acini magni, pauci, discreti.

44. R. saxatilis *Linn.*

Subsec. II. ARCTICI. Caules steriles nulli. Rhizomata subterranea longa. Flores terminales, subsolitarii. Acini in baccam compositam congesti.

45. R. Chamæmorus *Linn.*
[R. arcticus *Linn.*]

RUBUS Linn.

SEC. I. RUBI FRUTESCENTES.

Caules suffruticosi. Folia subquinata. Stipulæ ineares ad basin petiolorum affixæ. Flores subpanicu-ati. Acini in baccam polyspermam compositam con-esti. Receptaculum conicum.

SUBSECTION I. RUBI IDÆI.

Caules steriles suberecti, biennes. Receptaculum a ructu discretum. Folia sæpissime pinnata.

The fruit being so constructed that the receptacle is not leciduous with the acini separates the *Idæi* from the *Fruti-osi* in a marked manner. These may be considered as the only ruly erect brambles included in our flora; for their stems ave never been even suspected of arching so as to reach the round at the end, and rooting there. But although these ompletely erect stems of *R. Idæus* and its allies are very haracteristic of the plants contained in this group, never-heless, there are some other species which have suberect tems; especially those of the group denominated *Suberecti.* 3ut the peculiar characteristic of the *Idæi* consists in their ruits separating from the receptacle, whereas in all the *ruticosi* the receptacle falls with the acini adhering to it.

1. R. Idæus Linn.

R. caule erecto tereti pruinoso, aculeis setaceis rectis, foliis quinato-pinnatis ternatisve subtus niveo-tomentosis, foliolo terminali longè pedicellato *lateralibus dissitis, aculeis ramorum floriferorum* et pedunculorum *è basi dilatata compressa deflexis,* floribus racemosis.

R. Idæus Linn.! Sp. Pl. ed. 1. 492 (1753); Fl. Suec. ed. 2. 172. Sm.! Fl. Br. ii. 541; Eng. Fl. ii. 407. Eng. Bot. t. 2442. Trattin. Ros. iii. 6. Rubi Germ. 107. t. 47. Lindl.! Syn. ed. 1. 95; ed. 2. 92. Borr.! in Hook. Br. Fl. ed. 2. 243; ed. 3. 245. Arrh. Mon. 11. Leight.! Fl. Shrop. 222. Johnst.! E. Bord. 60. Fries Summa, 164. Bab.! Man. ed. 6, 105; Syn. 6. Godr. Mon. 40; Fl. Lorr. ed. 2. i. 245; Fl. de Fr. i. 551. Lees! in Steele, 60; Bot. Malv. 58. Blox.! in Kirby, 48. Sond. Fl. Hamb. 271. Bor. Fl. centre Fr. ed. 3. 187. Metsch in Linnæa, xxviii. 104. Garke Fl. Deutschl. ed. 7. 127. Syme's Eng. Bot. iii. 160. t. 442. Wirtg.! Herb. Rub. 115 and 47 (sp.). Billot! Fl. Gall. et Germ. exsic. 1658 (sp.).

R. frambœsianus Lam. Fl. Fr. ed. 1. iii. 135 (1778).

R. Idæus spinosus fructu rubro Raii Syn. ed. 1. 228; ed. 3. 467; Hist. 1640.

Rhizome creeping. *Stem* erect, nodding at the top, pruinose, terete, downy, 2-6 feet high. *Prickles* usually many, setaceous, declining, purple, sometimes few, from an enlarged base of the same colour. *Leaves* quinate-pinnate or ternate. *Leaflets* plicate, downy above, snowy white and felted beneath, lobate-serrate; lower pair subsessile, broadly ovate, acuminate, sometimes lobed on the outer edge; upper pair distant from the lower, sessile, ovate, acute, rather unequal below; terminal stalked, ovate, subcordate at the base, acuminate; stipules slender; petioles which are channelled above and under side of midribs with a few small slightly hooked prickles. Rarely the leaves have three pairs and a terminal leaflet.

Flowering shoots surrounded at the base by fuscous scales, short, flowering throughout their length. *Prickles* small, deflexed, from a compressed dilated base, coloured like those of the stem, sometimes very few. *Leaves* ternate, rarely pinnate. *Leaflets* like those of the stem. *Peduncles* from the lower axils one- or few-flowered. *Panicle* many-flowered, corymbose; flowers all pendulous. *Sepals* ovate, acuminate, with a slender reflexed point, greenish white, felted, with a white edge, often prickly, spreading. *Petals* narrow, erect, white. *Fruit* crimson or amber-coloured.

There is a variety of this plant having amber-coloured fruit, pale prickles on the stem, and the leaflets rather obovate. It is the White Raspberry of gardens, but is not often found wild. The *R. Idæus β. asperrimus* (Lees ! in Steele's *Handb.* 60) is a very prickly state of this variety. His specimen is trifoliate.

A form having septenate leaves on the stem and pinnate leaves on the flowering shoots is mentioned by authors, but I have not seen a specimen of it.

The British ternate-leafed plant (*β. trifoliatus* Bell Salt. ! in *Ann. Nat. Hist.* xvi. 365; and Bromf. *Fl. Vect.* 154) is very strong and luxuriant. Its leaves are larger than those of any other form of the species; the terminal leaflet is long-stalked, deeply cordate at the base, and often has three deep acuminate lobes at the end. I possess specimens of it from the Isle of Wight and the Lake Country of the north of England. I have not seen the *γ. microphyllus* of Lees (l. c.), which he describes as possessing very small trifoliate leaves, but gives no further information concerning it. It is probably the β. *microphyllus* of Wallroth (*Sched.* 226), which has "foliis constanter ternatis, duplo minoribus; caule 1- 2-pedali, recto, a basi inde ramoso." A trifoliate specimen, gathered at Shrawley in Worcestershire in the year 1836, and supposed by Mr Lees to be "probably *var. trifoliatus* of Bell Salter and Babington," is not that plant. Its leaflets, although only in threes, closely resemble those of the typical *R. Idæus* both in size and shape. Such is also the case with his *var. asperrimus* mentioned above.

Habitat.—Damp edges of woods, and heaths. June.

Area.— 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 . 18 19 20 21 22 23 24 25 26 27 28 29 30.

Localities.—It is so generally distributed that no special localities are requisite. I have not seen specimens from (xvii.) the *North Highlands*, nor (xviii.) the *North Isles*, but Mr Watson states that it was found by the late Dr Neil in Orkney. It is recorded in the *Cybele Hibernica* as occurring in Provinces 23, 25, 26, 27 and 29.

2? **R. Leesii.** Bab.

R. caule erecto tereti, aculeis setaceis rectis, *foliis ernatis*, foliolis omnibus rotundato-ovatis subsessilibus mbricatis, *aculeis ramorum floriferorum* pedunculo-umque paucis setaceis *basi bulbosis*, floribus racemosis.

R. Leesii Bab.! in Steele's Handb. 60 (1847); Man. ed. . 92 (1851); ed. 6. 105; in Ann. Nat. Hist. Ser. 2. ix. 123. Lees in Eng. Bot. Suppl. t. 2981. Syme's Eng. Bot. ii. 161. t. 443.

R. Idæus γ. *Leesii* Bab.! Syn. 6 (1846). Bell Salt. in Hook. and Arn. Br. Fl. ed. 7. 123.

R. Idæus c. *fragrariæ-similis* Lees in Lond. Cat. Br. Pl. (name only).

Rhizome widely creeping. Stem erect, nodding at the top, terete, downy, with short adpressed hairs and many subsessile glands, 2—3 feet high. *Prickles* many, slender, setaceous, declining, with bulbous or oblong bases, pale purple. *Leaves* ternate. *Leaflets* similar, roundly ovate, dark green and rugose above, snowy white and felted beneath, coarsely crenate-serrate-apiculate; lateral sessile, overlapping the very shortly stalked terminal leaflet. *Petioles* furrowed and having a few small declining prickles beneath; the midribs of the leaflets either unarmed or having a very few minute prickles beneath. *Stipules* very slender.

Flowering shoots from fuscous scales, short, flowering in their upper half, clothed with short deflexed hairs. *Prickles* slender, setaceous, declining, from bulbous bases. *Leaves* mostly simple, cordate, slightly 3-lobed, very coarsely crenate-serrate, green above, greenish white beneath: sometimes there is a small ternate leaf at the base of the shoot

having small roundly obovate blunt leaflets, all very shortly stalked, but the stalk of the terminal leaflet rather the longest. *Flowers* in a lax simple raceme of which one or two of the lowest peduncles are axillary. *Peduncles* with small and very slightly deflexed prickles. *Sepals* oblong, often more than five in number, in which case they are linear, cuspidate, greenish white and felted on both sides; the point slender, short, slightly reflexed, glabrous. *Petals* spathulate, acute, white. *Stamens* and *styles*, white. *Fruit* rarely produced, of few crimson drupels with the taste of Raspberry, and doubtfully perfect. One or two drupels gathered in 1865, in the Cambridge Botanic Garden, seemed to contain seeds.

Plants which creep extensively underground often do not produce much fruit; but, bearing in mind that the close ally of this plant (*R. Idæus*) fruits abundantly, the fact that *R. Leesii* rarely attempts the formation of fruit, and that even when its drupes are apparently well ripened they seem to be usually devoid of any perfected seed, we are led to suspect its distinctness as a species. Should it really be a state of *R. Idæus* it must be considered as exceedingly curious. All the trifoliate forms of *R. Idæus*, with perhaps one exception, differ remarkably from *R. Leesii* by having a very long stalk to their terminal leaflet; also, if placed side by side with *R. Leesii*, the leaflets are seen to have very little similarity, however difficult it may be to convey an idea of the difference by description. The exception referred to is the *R. Idæus* c. *anomalus* of Arrhenius (*Mon.* 14), which is stated to have usually "folia plerumque simplicia cordato-rotundata vel reniformia;...folia ternata imis duobus breviter petiolatis, ... extimo mediocriter petiolato subrotundo." If we could suppose that these words are intended to describe the leaves of the flowering shoot alone, there would be little doubt of the identity of the *R. Leesii* with the *var. anomalus;* but an expression of Arrhenius shows that he had the sterile stem before him when writing the account of his plant, for he remarks "si ex frutice sterili judicares, hunc ad *R. Idœum* vix traheres," and we are therefore probably right in supposing that the leaves described in the above quotation were taken from the stem not from the flowering shoot, although those of the latter may have been similar. He also says "Omnia basin versus angustata," which does not apply to the leaves of our plant. I have not observed the least approach to the simple condition of leaves on stems of *R. Leesii*, either in a wild or cultivated state. The lateral leaflets of *R. Leesii* accord tolerably with the description of Arrhenius. They are almost sessile but scarcely narrowed at their base: the terminal leaflet has a stalk which I have never seen to exceed one-sixth of an inch in length, and it is usually shorter. Nevertheless Hr. de Brugh in the *Nederlandsch Kruidkundig Archief* (iv. 460) decides that our *R. Leesii* is identical with the *R. Idœus c. anomalus.* Unfortunately I have not access to Swedish specimens of the *var. anomalus.*

The figure in *Eng. Bot. Suppl.* (t. 2981), and in Syme's *Eng. Bot.* (t. 443), erroneously represents the terminal leaflet as having a considerable stalk. This is a mistake made by the engraver of the plate which was unfortunately not seen in time for its correction.

Habitat.—Woods and thickets. June.

Area.—1 . . . . 12.

Localities.—i. In a wood near Ilford Bridges, three miles from Linton, *N. Devon*, where it was discovered by *Mr E. Lees*, in 1843. On a shingly bank near Bonniton, not far from Dunster, *W. Som.*, where it was detected by the late Rev. W. H. Coleman, in 1849.—xii. By the side of a stream that flows into Windermere between Troutbeck and Bowness, *Westmoreland. Mr E. Lees*, in E. B. S. fol. 2981.

SUBSECTION 2. RUBI FRUTICOSI.

Caules biennes vel perennantes. Receptaculum ad fructum adherens et cum eo desidens. Folia digitata, pedata, vel rarissime subpinnata.

The following subdivisions are difficult to define, and not very clearly separated in nature; but the characters given will, it is believed, usually be found to group the plants in a satisfactory manner.

GROUP I. SUBERECTI.

Caules sæpissime suberecti, glabri vel sparsim pilosi nec setosi nec pruinosi neque tomentosi. Aculei æquales.—Sepala intus albo-tomentosa, extus pilosa margine albo-tomentosa.

The stems of these plants are very characteristic of the group. They are nearly as erect as those of the *Idæi* and nod more or less at the extremity: but sometimes they form a considerable angle (say 90°) with the horizon. In no case have I seen or been informed of their arching to the ground. One or two abnormal forms, found under deep shade, which seem to be states of the plants belonging to this group, have quite prostrate stems.

The panicle is usually nearly simple and racemose or slightly corymbose; flowers large; sepals often quite green and glabrous externally, with the exception of an edging of white felt similar to that which clothes their inner side.

3. **R. suberectus** Anders.

R. caule erecto obtusangulo, *aculeis* raris rectis *brevibus exiguis e basi dilatata* compressa conicis ad angulos caulis congestis, foliis 3-5-7-natis, *foliolis flexibilibus planis,* foliolo terminali cordato-acuminato *infimis* subsessilibus *ramorum floriferorum basi attenuatis,* floribus racemosis vel subpaniculatis rachi et pedunculis pilosis, sepalis a fructu (atro-sanguineo) reflexis.

R. suberectus Anders.! in Linn. Trans. xi. 218. t. 16. (1816). Sm.! in Eng. Bot. t. 2572; Eng. Fl. ii. 409. Lindl.! Syn. ed. 1. 91; ed. 2. 92. Arrh.! Mon. 19. Leight.! Fl. Shrop. 223; in Phytol. iii. 72. Blox.! in Kirby's Fl. Leicestr. 48. Lees in Steele's Handb. 59. Bab.! Man. ed. 6. 106. Fries! Summa, 164; Herb. Norm. vi. 44 (sp.). Bor. Fl. Centre, ed. 3. 204. Metsch in Linnæa, xxviii. 130. Godr. Fl. Lorr. ed. 2. i. 244. Lange! Danske Flora, 341 (excl. var. *β*). Billot.! Fl. Gall. et Germ. exsic. No. 1178 (sp.).

R. umbrosus Lees! in Steele, 60. (1847).

R. fastigiatus Rub. Germ. 16. t. 23. Blox. in Kirby, 48? Wirtg.! Herb. Rub. 31 (sp.).

R. plicatus Leight.! Fl. Shrop. 223. Nees! in Leight. Fl. Shrop. 224.

R. pseudo-Idæus Müll.! Mon. 2.

R. nitidus Lindl.! Syn. ed. 1. 92.

R. affinis Lindl.! Syn. ed. 2. 92.

Stem thick, of a soft spongy consistence, green (or reddish in exposed situations), terete near the base, angular or even furrowed towards the top, glabrous, bearing a few subsessile glands chiefly on its lower part, erect, 3-6 feet high, ulti-

mately nodding slightly at the top. *Prickles* few (except near the base), small, slender, usually scarcely exceeding in length the long diameter of their large dilated base (except at the extremity of the stem), confined to the angles of the stem, slightly declining. *Leaves* usually quinate, sometimes pinnate-septenate, rarely ternate. *Leaflets* large, flat when full-grown, thin, unequally serrate, green on both sides, slightly adpressed-pilose and shining above, paler and hairy on the ribs beneath, acuminate; basal leaflets of the ternate leaves lanceolate, intermediate ovate, terminal cordate-ovate; basal leaflets of the quinate leaves lanceolate, intermediate ovate-lanceolate, terminal cordate-ovate; basal and intermediate leaflets of the septenate leaves like those of the quinate leaves, but in place of one terminal leaflet there are three leaflets of which the lateral are sessile and unequally ovate, and the middle leaflet is shortly stalked and ovate-lanceolate; except as above-mentioned the leaflets are all stalked, the basal very shortly, intermediate rather shortly, terminal long-stalked; furrowed petioles and midribs beneath with large-based hooked prickles. *Stipules* slender.

Flowering shoot from dark brown scales, suberect, often scarcely more than a leafy raceme, with short deflexed (but often very few) prickles and sessile glands. *Leaves* ternate; leaflets all ovate, rounded or narrowed not cordate at the base; lateral subsessile, terminal stalked; uppermost leaves simple, ovate-lanceolate. A *panicle* or raceme; lower flowers axillary, usually long-stalked. *Sepals* reflexed, unarmed, ovate, leaf-pointed, externally dark green and glabrous but edged with white felt. *Petals* large, obovate, narrowed below, entire, white, much exceeding the sepals. *Filaments* and *anthers* "rather fuscous." *Styles* "greenish," falling short of the stamens. *Primordial fruit-stalk* shorter than the sepals. *Fruit* dark red, ultimately of a deep red (port-wine) colour, sourish.

R. suberectus β. trifoliatus of Bell Salter is often a very large plant having enormous leaflets, but differs in no essential point from the ordinary state of the species.

The typical form of this plant cannot be confounded with any of our other species. It has the habit of *R. Idæus;* its leaves are often septenate by the separation of two leaflets from the base of the middle leaflet, they are thin, flexible and slightly pilose or quite glabrous; the petioles and rachis bear a few short hooked prickles. The nflorescence is small, of a few solitary axillary flowers, and a small open terminal raceme. The floral leaves have all their leaflets narrowed to the base, not cordate.

This is certainly the plant of Anderson, although, very probably, some specimens of *R. plicatus* and *R. fissus* were ncluded in his idea of the species. He found it "in the wood behind the Devil's Bridge, Cardiganshire;" a densely-shaded spot where *R. suberectus* is likely to occur, but where the presence of either *R. plicatus* or *R. fissus* is very improbable.

It may reasonably be doubted if *R. suberectus* is the *R. nessensis* of Hall (*Trans. R. Soc. Edin.* iii. 20). The "full" description spoken of by Anderson, certainly is far from what we now consider such; it is as follows:—"Rubus (Nessensis) foliis quinato-digitatis, ternatis, septenisque nudis, caule subinermi, petiolis canaliculatis; stolonibus erectis biennalibus." He also tells us that the fruit which is of the "colour of the red mulberry, has a peculiar taste." That is all. He found the plant "in different places on the banks and among the woods of Loch Ness, where it could not come from the same root." I incline to the opinion that the typical plant was what is now called *R. fissus*, notwithstanding the applicability of parts of the above character to *R. suberectus*. The former species is apparently common in the Highlands of Perth and Inverness; the latter is scarce there. I do not therefore quote *R. nessensis* as a synonym of either of these plants.

Fries makes the following important remark concerning his plant. "Hic per regiones montanas sylvaticas Gothiæ totius vulgatissimus, ubi omnes sequentes fruticosi [*R. fruticosus* = *R. plicatus*, *R. affinis*, *R. thyrsoideus*] desunt, novum offert exemplum ridiculæ hodiernæ hybriditatum venationis" (*Mant.* iii. 40). The total absence of *R. plicatus* from a province in which *R. suberectus* abounds, strongly tends to prove that Dr Walker-Arnott (*Brit. Fl.* ed. 8, 123) is incorrect in combining them, without acknowledging their distinction even as varieties. The fact that *R. plicatus* and *R. fissus* are often called *R. suberectus* by Scottish collectors, will possibly explain this proceeding of that eminent botanist.

Godron, Sonder, and Boreau, quote the *R. fastigiatus* (W. and N.) as identical with this species. They are probably correct. It is represented by the *R. umbrosus* (Lees), my specimen of which accords well with the figure in the *Rubi Germanici* (t. 2); but Mr Lees does not state, and would seem rather to deny, that the barren stems are very long (15 to 20 feet) and arching, as they are said sometimes to be by the authors of the German work. They (Weihe and Nees) remark that this arch is not a constant character of their plant: "surculus.........qui primo vere germinans, primum recte ascendit, tum per tempus prolixior, pedetentim in arcum curvatum ad terram inclinat; itaque in eodem dumeto, e libero solo surgente, surculos invenies alios fere erectos, alios ad dimidiam longitudinem dependentes, alios denique qui terræ jam redditi, novas radices propellant."

On the other hand Arrhenius (*Fries Summa*) quotes the *R. fastigiatus* (W. and N.) as an undoubted form of his *R. fruticosus* (which is our *R. plicatus*), and it seems probable that he had in view a plant closely allied to *R. fastigiatus*

(Bab.), and therefore different from that of M. Boreau, but identical with the specimen in Billot's collection (No. 1177).

If these views are correct, the *Suberecti*, although nearly constantly suberect, may, under peculiar circumstances become arched, and thus, as has been already remarked, the only really suberect European species are the *Idæi*.

Anderson's plate (*Linn. Trans.* l.c.) exceedingly well represents the barren stem of our plant, as does the plate in *English Botany* the flowering shoot: together they constitute a good illustration of *R. suberectus*. There is a specimen named by Anderson in Edw. Forster's Herb., now in the British Museum, from a place in Scotland named Stonybyers. It is marked by Smith as the true plant, and is our *R. suberectus*.

The specimen of *R. nitidus* (Lindl.) from the Hort. Soc. Garden, is *R. suberectus* (Anders.); in his second edition he says that it is *R. affinis* of that work.

The late Mr G. Don of Forfar, found this plant before 1813, and gave it the manuscript name of *R. intermedius!* He said of it (Headrick's *Forfarshire*, Appendix 25), "a new species. It grows near the waterfall called the Reeky Linn, on the water of Isla."

Habitat.—Boggy woods and thickets. June.

Area.—1 2 3 . 5 . 7 8 . 10 . 12 13 14 15 16 . . 19 . . . . . . 26 . . . 30.

Localities.—i. Between Barnstaple and Combe Martin, *N. Dev.;* Plym Valley (Briggs!); Exeter, *S. Dev.* (Linn. Brit. Herb.); Dunster, *S. Som.*—ii. America and Apse Castle wood, *Isle of Wight;* Ashdown Forest, *E. Suss.* (Borr.!).—iii. Easney Park wood, *Herts* (Fl. Herts.); Newbury, *Berks* (Linn. Brit. Herb.); Esher, *Surr.* (Borr.!).—v. *Worcester*, *Warwick* and *Hereford* (Blox.); Almond Park, *Salop.*—vii. Devil's Bridge, *Card.* (Anderson); Wood near Rhaiadyr Mawddoch, and Dolgelly, *Merion.*—viii. Charnwood

Leic. (Blox.).—x. Richmond, *N. W. York.* (Linn. Brit. Herb.).—xii. *Westmoreland* and *Cumberland* (Hort).

xiii. Gouroch, *Renf.;* Jardine Hall, *Dumf.*—xiv. Grant's House, *Berw.* (Edin. Herb.).—xv. By the river Isla, *Forf.* (G. Don!); Inverarnan, Loch Lomond; Banks of Loch Tay; Callander (Linn. Brit. Herb.), *W. Perth;* Ben Lomond, *Stirl.* (Balfour).—xvi. Dunoon, *Main Arg.* (Hooker!).

xix. *Cork* (Mackay).—xxvi. Headford, *E. Galway* (Mack.). —xxx. Deer-park, Newtown Limavady, *Derry* (D. Moore).

4. **R. fissus.** Lindl.

R. caule suberecto vel subarcuato, obtusangulo, *aculeis crebris* tenuibus rectis vel deflexis *è basi oblonga paululum dilatata* conicis *sparsis,* foliis 5-7-natis, *foliolis plicatis,* foliolo terminali cordato-ovato infimis sessilibus ramorum floriferorum basi sæpe plus minusve gibbosis, panicula simplici racemoso-corymbosa pilosa, *sepalis fructum* (atro-sanguineum) sæpe *laxe amplectentibus.*

R. fissus Lindl.! Syn. ed. 2. 92 (1835). Leight.! Fl. Shrop. 225; in Phytol. iii. 72; Shropshire Rubi, 2. (sp.) Bab. Man. ed. 3. 93; ed. 6. 106; A. N. H. ser. 2. ix. 124.

R. plicatus Leight.! Shrop. Rubi, 3. (sp.).

R. suberectus β fissus Lange, Danske Flora, 342.

Creeping. *Stem* hard, scarcely angular at the base, bluntly ngular towards the end, considerably inclined, but not rching to the ground, 1½-2 feet long, hairy, rather glaucous, with many subsessile glands. *Prickles* many, slender, usually much longer than the long diameter of their small dilated base, scattered (that is, not confined to the angles of the stem).

Leaves quinate or pinnate-septenate. *Leaflets* rather oriaceous, plicate, unequally serrate, green on both sides, pilose and dull above, paler with rather crisped shining hairs beneath (sometimes so covered with these hairs as to seem elted); basal oblong, acute, very nearly or quite sessile; ntermediate ovate; terminal cordate-ovate, cuspidate; sep-enate leaves similar, but in place of the terminal leaflet here are three leaflets of which the lateral are oval, acute, nd sessile, the terminal ovate or obovate, subcordate below, and stalked; furrowed petioles and midribs beneath with many hooked prickles; stipules linear-lanceolate.

Flowering shoot from dark brown scales, rather hairy, with a few subsessile glands and a few scattered declining or deflexed prickles. *Leaves* ternate; leaflets oblong-ovate, rounded or narrowed at the base; basal sessile, sometimes rather gibbous on one side at the base; terminal stalked: uppermost leaves simple, ovate. *Panicle* simple, racemose-corymbose; lower flowers axillary, longstalked. *Sepals* at first patent, afterwards often loosely clasping the fruit, ovate-acuminate, shining, green, and often nearly glabrous externally, edged with white felt. *Petals* white, oval-spathulate. *Stamens* whitish. *Styles* cream-coloured. *Primordial fruit-stalk* rather short. *Fruit* bright red until very nearly ripe, ultimately of a port-wine colour.

I formerly separated many plants from *R. fissus*, and joined them to *R. plicatus*, which I am now quite convinced really belong to *R. fissus* and that *R. plicatus* must include only the strong plants which have stout hooked prickles upon their stems, and do not usually if ever, possess a lobed terminal leaflet or three leaflets in its place. As far as our plants are concerned that form of leaflet, combined with a suberect stem, seems to be confined to *R. suberectus* and *R. fissus*. The stems of *R. fissus* are truly suberect; they sometimes arch considerably, but never reach the ground and root there. When its prickles are few in number they are confined to the angles of the stem, but when more abundant they also grow upon its convex faces, and in that respect differ from those of the allied plants. The prickles resemble those of *R. suberectus*, but are much longer relatively to their bases. The flowering shoot has not the gibbous nor broadbased lateral leaflets of *R. plicatus;* nor are they so narrowed at the base as those of *R. affinis*. The erect-patent calyx is not constantly present with the fruit.

dpressed and reflexed sepals may be found on the same anicle.

The late Mr Borrer was of opinion that *R. fissus* is istinct from *R. plicatus* and *R. suberectus.* Mr Lees coniders *R. fissus* to be only "a more prickly and hairy ariety" of *R. suberectus;* but a specimen of his *R. fissus* ow before me is scarcely, if at all, different from *R. affinis,* nd cannot possibly be the *R. fissus* of Lindley.

Dried specimens often very much resemble *R. pruinosus* Arrh.), and might well pass for it. But *R. pruinosus* has caulis sterilis ad saxa procumbens, sex ulnas et ultra lonas, tandemque radicans," and therefore has no true relaionship to our *R. fissus.*

I have been unable to identify *R. fissus* with any of the escribed *Rubi* of continental authors.

Mr J. Lange considers a specimen of *R. fissus,* sent to im by me, to be a variety of *R. suberectus* (*Danske Flora,* 42), and mentions that the same plant grows near Fredericia.

Mr W. Wilson's plant from Woolston Moss, which is oticed in *Leight. Fl. Shrop.* (224), is *R. fissus.* Formerly I onfounded it with *R. plicatus,* but Leighton always rearded it as distinct from that species.

Habitat.—Wet and peaty ground, June to August.

Area.—1 . . . 5 . 7 8 9 10 11 12 13 . 15 16 . . . . 30.

Localities.—i. Ivy Bridge, *N. Devon* (Briggs!).—v. Alnond Park, Twyford Vownog near West Felton, and Shawury Heath, *Salop;* Wood east of Tintern, *W. Glouc.*—vii. Dolwyddelan (Borr.!) and Llanberis, *Caern.;* Near Lanfiangel, between Cerreg y Druidion and Ruthin, *Denb.* Borr.!); Dolgelly, Bala, and Cwm Bychan, *Merion.*—viii. Charnwood Forest, *Leic.* (Blox.!).—ix. Carrington Moss near Sale (G. E. Hunt!), and Woolston Moss, *Ches.*—x. Kilsdale in Cleveland (Baker!), Thirsk (Hailstone), and near York, *N.E. York.*—xi. Near High Force in Teesdale, *Durh.* (Baker !). — xii. Brathay, *Westm.* (Borr. !); Threlkeld, *Cumb.*

xiii. Jardine Hall, *Dumf.;* Loch Lomond, *Dumb.* (Hailstone !).—xv. Clova, *Forf.*—xvi. Dalmally, *Main Argyle.*

xxx. By river Foyle, near Londonderry (D. Moore), *Derry;* Saintsfield, *Down.*

5. **R. plicatus** W. and N.

R. caule suberecto obtusangulo, aculeis validis decli-
tis vel deflexis e basi oblonga dilatata conicis in
gulos caulis congestis, foliis quinatis, *foliolis* plus
inusve *plicatis* tenuibus *subtus pilosis* nec tomentosis,
liolo terminali cordato-acuminato infimis sæpissime
ıbsessilibus *ramorum floriferorum lateralibus rhombeo-*
atis basi dilatatis, floribus racemosis vel corymbosis,
achi et pedunculis pilosis nec tomentosis, sepalis a
ructu (atro) reflexis.

R. plicatus Rubi Germ. 15. t. 1 (1822). Trattin. Ros. iii.
0. Borr.! in Eng. Bot. Suppl. t. 2714. Leight. in Phy-
ol. iii. 73. Bell Salt.! in Bot. Gaz. ii. 117; in Bromf., Fl.
Vect. 155. Blox.! in Kirby 47. Lees! Malv. 57. Johnst.!
E. Bord. 60. Bab.! Man. ed. 1. 97; ed. 6. 106. Lange!
anske Fl. 342. Müll.! Vers. 2. Syme, Eng. Bot. iii. 166.
445.

R. nitidus Sm.! Eng. Fl. ii. 404. Johnst.! E. Bord. 61.
illot! Fl. Gall. et Germ. exsic. No. 2668 (sp.).

R. fastigiatus Bab.! Syn. 8; Man. ed. 2. 97. Weihe in
eichenb. Fl. exsic. No. 786 (sp.). Wirtg.! Rub. Rhen. No.
et 2 (sp.). Müll.! Vers. 2.

R. fruticosus Linn. Fl. Suec. ed. 2. 172 (in part). Wahlb.
l. Gothob. 54. Arrh.! Mon. 23. Fries! Summ., 164; Herb.
orm. v. 51 (sp.). Reichenb. Fl. excurs. 100. Godr. in Fl.
r. i. 349; Fl. Lorr. ed. 2. i. 243; Monog. Rub. Nancy, 36.
nd.! Hamb. 272 (excl. var. β). Van den Bosch Fl. Batav.
. Bor. Fl. Centre, ed. 3. 204. Metsch in Linnæa, xxviii.
6. Garke Fl. Deutschl. ed. 7. 118. Wimm. Fl. v. Schles.
1. Billot. Fl. Gall. et Germ. exsic. No. 1177 (sp.).

R. vulgaris Leight.! Fl. Shrop. 321 (in part).

R. suberectus Reichenb.! Fl. exsic. No. 780 (sp.). Wirtg. Fl. Preus. Rhein. 150.

R. suberectus β. plicatus Borr.! in Hook. ed. 2. 243; ed. 3. 246.

R. corylifolius Schultz Fl. Starg. 131; Suppl. 29.

R. appendiculatus Trattin. Ros. iii. 31. DC. Prod. ii. 561 (teste Questier).

R. fol. quinato-digitatis, &c. Linn. Fl. Suec. ed. 1. 148. No. 409.

R. hamulosus Müll.! in Jahresb. Pollichia xvi. 76.

Stem bluntly angular except at the tip, usually inclining but not truly erect, bearing many subsessile glands, hairless, more woody than *R. suberectus* or even *R. fissus*. *Prickles* unequal declining or deflexed, conical, springing from an oblong base, often falcate near the top of the stem. Lower *leaves* ternate, upper quinate; or rarely pinnate-septenate. *Leaflets* rather thin, serrate, very nearly glabrous above, shining, pilose but not felted, pale yellowish green beneath, more or less plicate; basal nearly sessile, imbricate, broadly lanceolate; intermediate shortly stalked, broadly lanceolate; terminal leaflet long-stalked, cordate-ovate prolonged (on the septenate leaves it is narrowed to the base and very shortly stalked, and its lateral leaflets are elliptic but unequal-sided); midribs and slightly furrowed petioles with small hooked prickles; stipules linear.

Flowering shoot from brown rather silky scales, hairy. *Prickles* strong, nearly straight, declining, or more often falcate, from a very large long compressed base. Leaves ternate; lower leaflets ovate, broad and gibbous below, sessile; petiole furrowed; uppermost floral leaves simple, cordate-prolonged. *Panicle* or raceme leafy below, sometimes throughout, with crisped hairs and many subsessile glands; nearly or quite without prickles in the typical plant, or furnished with rather abundant strong hooked prickles; terminal flower more shortly stalked than the lateral flowers. *Sepals* greenish, but finely and thickly silky externally, becoming glabrous except at the edge which has a felted border of the same fine wool which lines the inner side, reflexed. *Petals* distant, white or pinkish, ovate-spathulate, twice as long as the calyx, entire. *Anthers and styles* pale cream-coloured. *Primordial fruit-stalk* equalling the sepals and oblong fruit which is of a claret or blood-red colour, but ultimately becomes quite black, and is slightly acid.

R. nitidus (W. and N.) is usually joined to *R. plicatus* by those botanists who do not accept it as a distinct species. Weihe, Godron, and Boreau ascribe an adpressed calyx to it. Weihe's words are very decided, he says, "calycis laciniæ... peracta anthesi refractæ, maturo autem fructu rursum patentes vel etiam incurvæ." Godron also lays much stress upon it and uses the words "son calice appliqué." My specimens of English plants which it is probable belong to *R. nitidus* do not show decidedly the presence or absence of this character, which I am inclined to think is inconstant in this species, as I believe it to be in *R. affinis.* But there is another character upon which much stress is laid by those who separate the plants: *R. nitidus* has a more divided and decidedly prickly panicle; or rather, it has a panicle, whilst its ally has only a raceme. It is very difficult, indeed I consider it impossible, to distinguish between these forms of inflorescence in *Rubi.* I have before me a specimen from Mr Bloxam (gathered in 1846 at Appleby Road, Twycross, and marked as "No. 1. *R. plicatus*"), where two flowering shoots are given, of which one is simply a raceme like that of typical *R. plicatus,* bearing a very few slender declining prickles as in that plant; and the other is a panicle in which 9 out of the 11 branches are themselves branched (each of the upper having 2 and the